

CLAIMS:

1. A composite aircraft panel comprising an optical transmission means and an optical processing means optically connected to the optical transmission means for processing light to or from the optical transmission means, both the optical transmission means and the optical processing means being embedded within a carrier, wherein the optical processing means comprises means for collimating a light beam and the composite further comprises a high quality optical interface surface, as defined herein, provided within the carrier for connection with the optical transmission means by the optical processing means, the optical interface surface providing a means for optical connection to transmission means from outside the carrier.
2. A composite according to Claim 1, further comprising a passageway formed within the carrier to the embedded optical transmission means.
3. A composite according to Claim 2, further comprising a protective plug provided in the passageway for closing the passageway, the protective plug being removable prior to forming an optical connection.
4. A composite according to Claim 2 or 3, further comprising means for preventing laser irradiation light used in the formation of the passageway from being optically coupled with the optical transmission means, wherein the preventing means is arranged to differentiate between the wavelengths of laser light used in the formation of the passageway and the light used in the optical transmission means, and to prevent transmission of light used in the formation of the laser irradiated passageway to the optical transmission means.
5. A composite according to any preceding claim, further comprising detectable locating means arranged to be used in locating the position of the high-quality optical surface from the exterior of the carrier, wherein the locating means comprises an embedded detectable position marker within the composite.
6. A composite according to Claim 5 as dependent on Claim 4, further comprising a depth marker embedded within the composite to indicate when the passageway has been formed to the correct depth, the depth marker also comprising the position marker.

7. A composite according to Claim 6 as dependent from any of Claims 2 to 5, wherein the position marker or the depth marker comprises a sacrificial coating which is arranged to be removable after the formation of the passageway to access the optical transmission means.

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8. A composite according to any preceding claim, wherein the optical interface surface comprises at thermally expanded core optical fibre connected to the optical transmission means.

10 9. A composite according to any preceding claim, further comprising an alignment structure embedded within the carrier for aligning an interface means with the optical transmission means via the optical interface surface.

10. A composite according to any preceding claim, wherein the light beam collimating
15 means comprises a graded index lens or a graded index fibre.

11. A composite according to any preceding claim, wherein the optical transmission means comprises an elongate D-fibre which can be optical coupled to another D-fibre by aligning flat faces of the D-fibres together to form the optical connection.